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GEOLOGY AND PALÆONTOLOGY.

THE VERTEBRATA OF THE EOCENE OF THE WIND RIVER BASIN.—The current number of the Bulletin of the U. S. Geological Survey of the Territories, contains a synopsis of the extinct species above referred to. They number forty-five, and of these twenty-six are new to science. The species are distributed as

follows: Fishes—*Clastes*, 1 sp.; *Pappichthys*, 1 sp. Reptiles—*Lacertilia*, 2 sp.; *Testudinata*, 2 sp.; *Crocodylia*, 1 sp. Mammals—*Chiroptera*, 1 sp.; *Rodentia*, 3 sp.; *Tæniodonta*, 1; *Insectivora*, 2; *Creodonta*, 9; *Mesodonta*, 9; *Amblypoda* (*Pantodonta*), 2; (*Dinocerata*), 1; *Perissodactyla*, 8; ? *Artiodactyla*, 3. The new species are distributed as follows, all being *Mammalia*: *Chiroptera*, 1; *Tæniodonta* 1; *Insectivora* 2; *Creodonta* 8; *Mesodonta* 4; *Amblypoda*, 1; *Perissodactyla* 7; ? *Artiodactyla* 2.

The facies of the fauna is that of the Wasatch rather than that of the Bridger epoch, but it contains, nevertheless, several genera hitherto regarded as characteristic of the Bridger; such are *Pappichthys* and *Palæosyops*. The sub-order *Dinocerata* has not previously been found associated with *Coryphodon*. The sole representative of this division belongs to a new genus, and is named *Bathyopsis fissidens*, by Prof. Cope. The genus is defined as follows: Dental formula, I. 3; C. 1; Prem. 4; M. 3,—in the lower jaw. First premolar in the series with the incisors and canine, and followed by a diastema. The entire inferior border of the lower jaw expanded downwards into a plate with convex inferior border, thus differing from *Uintatherium* (*Dinoceras*), where the jaw is flared downwards in front only, and *Loxolophodon*, where there is little or no inferior expansion. There is a chamber-like enlargement of the dental canal, and a large mental foramen. The *B. fissidens* is about the size of the Malayan tapir. The anterior inner cusps of the inferior molars are double, and there is an oblique ridge commencing on the external border of the heel of the molars, and extending inwards and forwards.

PROF. KERR ON FROST DRIFT.—Prof. W. C. Kerr, State Geologist of North Carolina, read an interesting paper, February, 1880, before the American Institute of Mining Engineers, on what he calls *frost drift*, with especial reference to the gold deposits of his State. He finds a thick layer, sometimes amounting to a depth of one hundred feet, covering rocks in various parts of the State, which is evidently derived from their decomposition, and which has remained nearly in situ. He has observed, however, that the materials of these strata are frequently sorted, the larger undecomposed fragments lying near the bottom of the mass, hence it is evident that they have been moved, and without regard to the direction of the inclination of the surface. He thinks that this rearrangement has been produced by the alternate freezing and thawing of the bed. The gold of the placers has, in this way, gradually found its way to the bed-rock or slate, where it is now found by the miners. Placer mining has been practiced for many years in North Carolina, and the methods now in use in California, were carried there by emigrants from the former State.

DISCOVERIES OF MINERALS IN WESTERN NORTH CAROLINA.—During the month of May, 1877, while on a buggy trip from Statesville to Hickory, I discovered from my buggy a deposit of drift gravel along the roadside a few miles east of the town of Hickory, which promised something handsome in the line of quartz crystals. I started out on the 4th day of the following June (1877) to trace out the indications offered by that pile of gravel scattered promiscuously along the roadside. By actual measurement, the belt of drift deposit extending a long distance with a north-east and south-west trend, was three-quarters of a mile in breadth. My first diggings were on the lands of Mr. E. Bolch, and, under my personal supervision, soon reached a pocket of water-bearing smoky quartz crystals at a depth of two feet under ground. Here I found my first basal plane on quartz crystals (smoky and clay-tessellated). Devoting my entire time to field work in the drift belt of this neighborhood, I examined nearly fifty different localities found either by myself or by workmen trained under my personal teaching. The result by the 1st of January, 1878, was the discovery of thirty-five new localities for the following list of minerals, together with a determination by myself of the separate species:

Water-bearing crystals of quartz; Carbon dioxide-bearing crystals of quartz; Smoky quartz crystals; Amethyst quartz crystals; Quartz crystals enclosing layers of red clay; Quartz crystals enclosing coloring matter of various hues; Quartz crystals enclosing other crystals; Quartz crystals enclosing small prisms of mica; Quartz crystals enclosing pyrites; Quartz crystals enclosing rutile. (The most magnificent specimen of which (7x4 in.) enclosing three beautiful rosettes of rutile, I presented to my friend Mr. Wilcox, of Philadelphia.)

Having seen in the cabinets of my friend Stephenson, of Statesville, a number of so-called seventh planes on the *prisms* of quartz crystals which he obtained in Alexander county, I went diligently to work for such localities in Catawba county. My search, at first, was fruitless, but I observed a singular feature in some of the crystals dug from this first pocket I had discovered in this county. This feature consisted of a well marked plane parallel to the lateral axis, or a plane truncating the *pyramid* at a right angle to the prism. This I claim is the first American locality for quartz crystals with basal planes; the locality itself, as also the observation of the peculiar planes, being my own original discoveries. I delayed the publication of my secret through fear of attracting attention to the locality. This was in June, 1877. In July and September following I had discovered fifteen new localities in the vicinity for water-bearing quartz crystals, obtaining as many as 550 specimens. During the same months I obtained nearly seventy crystals with the basal planes. My work continued through the months of October and November, when the winter caused a suspension of field labors.

In the month of March, 1878, my field explorations were renewed, and with almost continuous work, extending through the months of April, May, June, July, August, September and

October of the same year. I discovered and worked on fifty-six different new localities yielding the same species before mentioned, with the addition of

Black Tourmaline; Brown Tourmaline; Green Beryl; Melanite (garnets) in Muscovite; Sagenite (meshed rutile); Acicular rutile; Rutile in amethyst. (This last named species I also claim as having first discovered in this country, if not in the world.)

The result then of my field work in Catawba county, N. C., from the 4th day of June, 1877, to the 1st day of November, was the discovery of ninety-one new localities for minerals and the scientific determination of the following list of species obtained from these localities new to science:

Quartz crystals, drusy; do, reniform; do, botryoidal; do, asteriated; do, acicular; do, aventurine; do, filiform; do, reticulated; do, water-bearing; do, carbon dioxide-bearing; do, enclosing layers of red clay; do, enclosing coloring matter of various hues; do, enclosing other crystals; do, enclosing (microlites after Vogel-sang); do, enclosing pyrites; do, enclosing small prisms of mica; do, enclosing rutile; do, (amethyst) enclosing acicular rutile; do, (amethyst) enclosing sagenite rutile.

Many of these were twins, geniculations, double terminals and in groups—varying in colors from black (of various shades) to the most pellucid variety, including green, yellow (citrine) smoky, purple, milky and almost every tint known to chemistry.

Crystallographically I have discovered in these new localities the following list of forms:

Basal planes.	Trigonal prisms.
Hexagonal pyramids.	Rhombohedrals.
Dihexagonal “	Trapezohedrals.
Trigonal “	And hemimorphic forms.

The weight of these separate crystals runs from one grain to one hundred pounds.

There are two very singular groupings among these crystals; the one being a number of amethyst crystals grouped upon a group of milky crystals, the other (resembling Fig. 335, p. 101, in E. S. Dana's Text Book of Mineralogy, Ed. 1877) being a series of quartz crystals all in a parallel position on the prism and pyramid faces of a group of acicular milky quartz crystals.

I believe I have discovered in this belt more than two-thirds of the forms of quartz known to science. This, however, I will determine before the year closes.

On a group of thirteen smoky crystals, having unitedly fifty-two easily discernible and movable bubbles, and nine different basal planes, there is one crystal with a basal plane and a cavity enclosing a gas, a liquid and a solid—the finest and most interesting specimen of its class which has ever been discovered.

In the months of July and August of 1878 I discovered two new localities, in Burke county, for basal planes on quartz, three new localities for sagenite and the golden colored rutile, two new localities for liquid-bearing crystals, one new locality for corun-

dum crystals with a border of fibrolite and enclosed in micaceous schist, one new locality for tourmaline, one new locality for aqua marine, and in conjunction with Mr. W. E. Hidden, I discovered forty-one different minerals in a few ounces of Brindletown gold sands, being by far the largest and rarest number ever obtained at one time by an examination of these celebrated sands:

Titanium.	Zircon.
Titanite.	Thorium.
Menaccanite vel Ilmenite.	Graphite.
Rutile.	Corundum (white).
Anatase vel Octahedrite.	“ (blue).
Octahedrite.	“ (red).
Ilmenite.	“ (gray).
Brookite.	“ (yellow).
Iron.	Feldspar.
Limonite.	Albite.
Mag. Iron.	Actinolite.
Granite.	Tourmaline.
Gneiss.	Schorl.
Itacolumbite.	Epidote.
Quartz.	Beryl.
Garnet.	Tremolite.
Schist.	Hornblende.
Monazite.	Soapstone.
Amethyst.	Kyanite.
Gold.	Cairngorm Stone.

This paper, in conclusion, is merely to place on record the results of my three years' field work amongst the minerals of North Carolina, until I can elaborate them (with engravings) in a substantial book form.—*John T. Humphreys, Greensboro, N.C.*

GEOLOGICAL NEWS.—Prof. Hitchcock is preparing a new geological map of the United States.—Prof. Hall has identified the Oneonta and Montrose sandstones, and finds them to form a fresh-water deposit below the Chemung.—Prof. Collett has found a remarkable deposit of extinct Unionidæ in Vandenburg county, Ia.—Prof. Leidy has determined a number of species of Vertebrata from bones found in a cave in Northampton county, Pa. All of the species are existing excepting two, a *Castoroides* and a Peccary. — Mojsisovics and Neumayr are publishing an extensive work, *Beiträge zur Palaeontologie von Oesterreich-Ungarn*. The two first monographs have appeared; they are Lugmayer on Rhætic *Brachiopoda*, and Bittner on Early Tertiary *Echinida* of the Southern Alps.

GEOGRAPHY AND TRAVELS.¹

THE EXPLORATIONS OF CAPELLO AND IVENS IN WEST CENTRAL AFRICA.—In previous numbers of the *NATURALIST* some accounts have been given of the expedition fitted out early in 1877, by the Government of Portugal and the Lisbon Geographical Society for the exploration of western and southern Central Africa. The party was under the command of Major Serpa Pinto, and started

¹ Edited by ELLIS H. YARNALL, Philadelphia.